chargepoint.com

chargepoin+

ChargePoint, Inc.
254 East Hacienda Avenue | Campbell, CA 95008 USA
+1.408.841.4500 or US toll-free +1.877.370.3802

VIA ELECTRONIC FILING

October 23, 2018

Ms. Elizabeth A. Rolando, Chief Clerk
Illinois Commerce Commission
527 E. Capitol Avenue
Springfield, IL 62701

Re: 18-NOI-01 – Notice of Inquiry Regarding Electric Vehicles

Dear Clerk Rolando,

Attached for electronic filing in the above-referenced matter, please find comments on behalf of ChargePoint, Inc., in response to the Notice of Inquiry issued on September 24, 2018. Please let me know if you have any questions.

Respectfully,

Kevin George Miller
Director, Public Policy
ChargePoint

1. Introduction

ChargePoint is the nation's leading electric vehicle (EV) charging network, with charging solutions for every charging need and all the places EV drivers go: at home, work, around town and on the road. With more than 56,000 independently owned charging spots, ChargePoint drivers have completed more than 45 million charging sessions, saving upwards of 45 million gallons of gasoline and driving more than 1 billion gas-free miles. More than 1,300 of our charging spots are deployed in Illinois.

ChargePoint designs, develops, and deploys residential and commercial AC Level 2 (L2) and DC fast charging (DCFC) electric vehicle charging stations, cloud-based software applications, data analytics, and related customer and driver services aimed at creating a robust, scalable, and grid-friendly EV charging ecosystem.

ChargePoint sells EV charging supply equipment (EVSE) and network services that enable EV charging station owners to provide charging services. In almost every case, ChargePoint does not own or operate the equipment. ChargePoint sells charging solutions to a wide variety of customers, including residential EV owners, employers, commercial and industrial businesses, cities and public agencies, ports, schools, public transit, delivery truck fleet operators, and multi-unit dwelling owners. ChargePoint offers a broad array of products and services that can serve light, medium or heavy-duty electric vehicles.

The site host network services offered by ChargePoint enable customers to manage their charging infrastructure using cloud-based software tools. These tools provide the station owner or operator with everything needed to manage and optimize utilization of their charging stations, including online management tools for data analysis, billing and payment processing, load management and access control. Stations connect to ChargePoint over a secure, cellular data network (or Wi-Fi in the case of single-family residential) allowing station owners to manage all their charging operations from a single dashboard. Maintenance and customer service are a priority for our company. ChargePoint offers a comprehensive set of support services, including: a 24/7/365 hotline for station users, parts and labor warranty, site qualification, installation and validation services, and a helpline for site host specific questions.

2. Grid Reliability and Resilience:

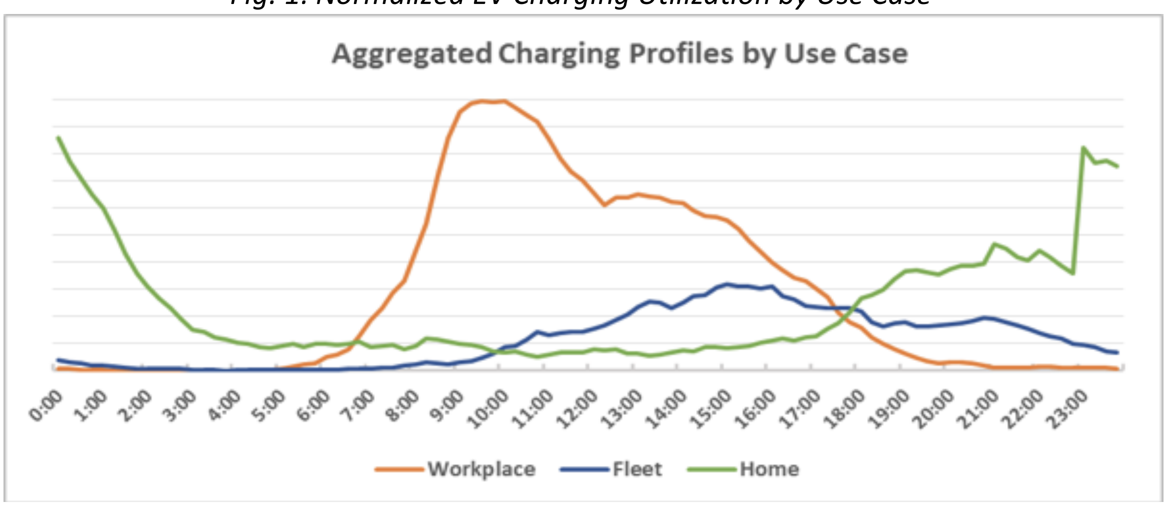
A. Describe whether and how EVs will improve grid reliability and resilience.

Transportation electrification has the potential to improve grid reliability and resilience, as well as create value for all ratepayers. Several studies highlight that the expected long-term energy revenues from incremental EV load generally exceeds the costs for the grid to support that load, such as *Engaging Utilities and Regulators on Transportation Electrification* (E3, 2015), *Plug-in Electric Vehicle Cost-Benefit Analysis: Illinois* (MJ Bradley, 2017), and others. In effect, investments in EVSE exert a downward pressure on unit energy costs that can benefit all utility customers regardless of EV ownership. However, this is predicated on the EV load not resulting in excessive new investments in distribution infrastructure costs and avoiding high cost "peak" generation and/or distribution time periods. The associated benefits of additional EV load to all utility customers could be significantly increased and grid infrastructure risks lowered by leveraging connected, smart charging infrastructure as well as developing smart charging programs.

B. Identify best charging practices and whether and how they can relieve pressure on the grid during peak-demand times, as well as relieve pressure on individual circuits.

ChargePoint encourages the Commission to consider the variety of ways in which the new load stemming from increased adoption of EVs can be shaped to create widespread grid benefits through electric rate design and load management techniques. The types and levels of benefits to the grid from EV charging taking place under an energy management program will vary greatly by EV charging use case, as illustrated in Fig. 1. We encourage the Commission to "right-size" the rate design and load management approach for each use case weighing factors such as potential coincidence with peak load, absolute proportion of charging in such use case, EV driver's flexibility in charging time and requirement, program complexity, and alignment of incentives throughout the EV charging ecosystem.

Fig. 1: Normalized EV Charging Utilization by Use Case



ChargePoint recommends that the Commission keep two key questions in mind when considering the relative value of energy management programs in different EV charging use cases: (i) what will be the impact on driver experience, and (ii) is this the best use case for energy management?

- Residential charging is perfectly suited for demand-side management programs due to the long dwell times available for charging, the ability to shift charging within that time period, and the EV driver typically serving as their own "site host". Furthermore, charging at home is far the location where the most EV charging will occur. One analysis conducted through the Idaho National Labs found that, on average, EV drivers charged their vehicles at home 64% of the time.[1] In addition, numerous studies have shown that residential charging is extremely responsive to price signals through time-of-use (TOU) rates.

- Fleet charging is an ideal use case to support demand-side management and smart charging of EVs. This is due to long dwell times, certainty around vehicle operational needs, and the direct relationship between the vehicle's owner and the charging station's owner.

- Workplace charging presents opportunities to shape charging during the day due to the extended dwell times and repeat users of such charging stations. The same INL study noted above also found that approximately 33% of EV charging is conducted at work. Workplace charging can be incentivized to avoid early morning peaks or to serve as a "sponge" for overgeneration of solar in the middle of the day.

a. Describe whether and how transportation electrification in the public and non-residential sectors will affect the load on the electric grid.

Publicly available charging, both AC Level 2 and DC fast charging (DCFC), is a very important part of the overall charging ecosystem. Publicly-available charging helps to ensure that EV drivers have "range confidence" around town and for non-routine trips. However, publicly-available charging is the least optimal use case for demand-side management programs for a few key reasons.

First, a very small percentage of total EV charging is, or will be, conducted at publicly-available stations. Only 2-3% of charging taking place outside of home and workplace.[2] Such charging is often randomized and occurs throughout the day. While publicly-available charging will likely grow as vehicles begin to support longer-distance travel, the majority of all charging will continue to take place at longer dwell-time, more predictable locations.

Second, there is an inherent difficulty in aligning the incentives between the site host (customer of record for the utility), the transient EV driver, who may or may not be a native utility customer, and the utility.

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[1] Smart, John. *Lessons Learned About Workplace Charging in the EV Project*. Idaho National Labs. 2015.
[2] *Id*.

Finally, drivers that plug into publicly-accessible EV charging stations are often relying on a quick charge to get back on the road. Any load curtailment or interference with their "refueling" would result in a poor driver experience and significantly impede EV adoption.

C. Describe whether and how development of additional charging infrastructure will affect grid reliability and resilience.

The development of additional charging infrastructure can readily support ongoing grid reliability and resilience through the implementation of utility programs that collect EV charging data, encourage the deployment of networked charging solutions, and develop new rates that facilitate the deployment of DCFC by commercial site hosts and encourage EV charging at times that are beneficial to the grid.

D. What other types of technology can be used to support grid reliability and resilience with continued electrification of the transportation sector?

ChargePoint's stations and cloud services, and those provided by our competitors, provide the ability for independent station operators to conduct load management of the allowable power level in real time in response to price signals from the utility.

In order to support utilities, which may not necessarily own or directly operate stations at home or in the commercial space, EV charging networks can provide the ability for station operators to grant access rights to utilities to conduct demand response on their stations. Like any other utility demand response program, the site host participants would likely receive some incentive in exchange for offering this capability. For example, ChargePoint offers the ability to utilize standards-based application programming interfaces, or APIs, to automatically send demand response commands to the ChargePoint Cloud and control stations in the field. Furthermore, the ChargePoint server is certified as OpenADR2.0b compliant, providing a common and open standard based interface for utilities to conduct load management events.

Allowable charging power levels can be completely shed, partially shed on a percentage basis of the actual load, or set to fall under a lower power level ceiling. Such load management events can be scheduled to expire after a period of time, returning to the equipment normal maximum power output, or the event can be immediately rescinded at any time. These demand response events can be programmed to occur for individual charging ports or any desired groups of ports.

In addition to load management capabilities, utilities can also be granted access to interval-level charging data that are recorded via the embedded meter of the charging station. These, and other, data provide valuable insight into the load profiles, charging dispersion by geographic locations and clustering, station uptime, and utilization trends over time for all stations involved in any utility program. Insights drawn from analyzing this data can inform system planning help to evaluate the effectiveness of a utility's EV charging program.

With existing technologies provided by networked charging solution providers, utilities can easily integrate with a variety of platforms (similar to smart thermostats) to issue load shedding commands, confirm response, and analyze charging data. In addition to load shedding events, utility programs can also use price signals to residential or commercial customers of record that host charging stations to encourage off-peak charging of EVs.

ChargePoint recommends that the Commission encourage utilities to explore demand side management programs targeted at reducing system peak, relieving distribution system congestion, and supporting renewable integration via smart charging at the home as an initial phase. We also recommend that utilities be encouraged to work in concert with automakers and the EV charging industry to develop solutions that leverage existing "consumer electronics" products and driver interfaces while being agnostic to specific vendors given the nature of the customer sited technologies being discussed.

E. Do vehicle-to-grid capabilities need to be enabled in order for EVs to provide grid support?

Two-way communication between EVs and the grid can be incorporated into a variety of different applications. From a communications standpoint, ChargePoint's stations already have the capability of communicating through standardized communication protocols, such as OpenADR2.0b. Advanced vehicle-to-grid (V2G) applications are also being explored through the utilization of other protocols, such as ISO 15118. California's Vehicle Grid Integration Working Group identified more than 70 different V2G applications that were possible through the use of ISO 15118.

One of the more commonly discussed "two-way" V2G functions is the ability of the EV to export energy back onto the grid for the purposes of providing frequency regulation or other ancillary services. The technology and standards around this particular use case is less developed than other more commercial applications discussed in the previous response. There are several challenges to the mass deployment of this type of functionality, including: vehicle battery warranty concerns, vehicle technological capabilities, metering and telemetry requirements, interconnection rules to ensure safe grid operations, comprehensive control algorithms, and contractual requirements that would provide sufficient value to all parties. Each of these challenges would likely require multiple policy actions, some which may include necessary action by PJM to address the ability of EVs to export energy onto the grid.

While V2G promises interesting capabilities in the future, "one-way" energy flow management of EV charging already exists. This currently-available load management can provide a vast majority of the potential grid benefits associated with transportation electrification.

F. What control by the utility is necessary to ensure reliability and efficient operation of the grid?

As discussed above, utilities can be granted the ability to conduct load management without have to actually own the EV charging equipment itself. In addition to grid needs, load management programs should also be designed to account for the needs of drivers, riders, and EV charging site hosts. EVs are, first and foremost, a transportation solution and therefore customer interests, choice, and driver experience are critical to ensuring that EV adoption continues to grow.

3. Barriers:

A. Describe regulatory barriers to increased electrification of the transportation sector.

Regulatory uncertainty is a key regulatory barrier to increased electrification of the transportation sector. Illinois has already taken an essential first step by clarifying that the provision of EV charging by non-utility third parties is a service, and not the sale of electricity:

> An entity that furnishes the service of charging electric vehicles does not and shall not be deemed to sell electricity and is not and shall not be deemed a public utility notwithstanding the basis on which the service is provided or billed. If, however, the entity is otherwise deemed a public utility under this Act, or is otherwise subject to regulation under this Act, then that entity is not exempt from and remains subject to the otherwise applicable provisions of this Act…[3]

Uncertainty about the appropriate role, or roles, for regulated electric utilities in the competitive EV charging market is also a barrier to increased electrification. Without guidance from the Commission, utilities will not have clear signals to support the development of programs that advance transportation electrification in Illinois while simultaneously supporting customer choice and the competitive EV charging market.

Related to offering EV specific time-of-use rates in the home, programs today can take advantage of embedded metrology in the charging stations that provide equivalent accuracy as today's traditional form-factor utility meters. This design eliminates the added cost, complexity, and time to install a separate revenue meter on the circuit while still providing the same interval level data which can be used to offer off-peak charging rates or incentives. However, use of such embedded device sub-metering for utility bill adjustments raises many regulatory

[3] 220 ILCS 5/3-105 Sec. 3-105.

questions that have yet to be addressed and thus may dissuade utilities from pursuing such designs.

Other jurisdictions are already exploring alternatives to installing separate revenue meters. ChargePoint is currently providing the networked charging solution for Green Mountain Power's managed home charging program in Vermont, which includes both demand response and an off-peak charging plan that leverages embedded metering. Additionally, the Minnesota Public Utilities Commission recently approved a pilot proposal by Xcel Energy to reduce the upfront cost burden for customers looking to opt into EV tariffs by implementing the tariff directly with a "smart" EVSE. *See* Minnesota Docket No. 17-817: Petition for Approval of a Residential EV Service Pilot Program.

a. Identify possible solutions to overcome regulatory barriers.

As will be discussed in the response to Question 4, ChargePoint recommends that the Commission issue clear guidance on the appropriate role for utilities in the competitive EV charging market and consider addressing feasibility and methods for using embedded metrology in devices such as charging stations.

B. Describe economic barriers to increased electrification of the transportation sector.

Economic barriers to increased electrification of the transportation sector should be considered in terms of upfront (capital) and ongoing (operating) costs. See Appendix A for a table identifying barriers to transportation electrification.

a. Identify possible solutions to overcome economic barriers.

ChargePoint discusses solutions to capital cost barriers in our response to Question 4. With regard to ongoing operating cost barriers, ChargePoint encourages the Commission to prioritize consideration for whether traditional, demand-based commercial rate structures are aligned with facilitating DC fast charging as the Illinois EV market grows.

Utilities use peak demand to properly size electrical facilities for their individual customers and to ensure they have adequate generating capacity available for all customers. Demand charges to customers are typically based on the highest average 15 minutes in a monthly billing cycle. Unfortunately, DC fast charging stations are currently characterized by having a low load factor with sporadic instances of very high energy use due to a limited number of vehicles in the market that will use these stations in the near term. This means that site hosts can potentially face very high demand charges despite low utilization in the early years, which effectively penalizes site hosts for providing DC charging services in earlier stages of adoption.

Several alternatives for cost recovery can be considered in any future evaluation of rate design specific to providing service to DC fast charging stations and to encourage more site hosts to deploy such stations by providing a more predictive and manageable operating cost structure. Examples include:

- Demand charges could be replaced with or paired with higher volumetric pricing to provide greater certainty for charging station operators with low utilization. This rate could be scaled based on utilization, time, or load factor as charging behavior changes over time with increased EV adoption.
- A retroactive and variable credit based on the difference of the effective blended per kWh distribution charge, including demand charges, and an agreed upon target blended rate, multiplied by the volumetric energy throughput in a given billing cycle for commercial customers with dedicated EV charging stations. (e.g. Long Island Power Authority's proposal in New York Public Service Commission Matter No. 14-01299: PSEG Long Island Utility 2.0 PLAN)
- The bank of charging stations could be put on a separate meter in order to use a unique "EV charging" rate that is designed to reflect charging needs. Note: it is not necessary to separately meter every single charging station, since many charging stations have embedded metrology.
- A pilot rate could be developed specifically for fleet operators, particularly those that operate electric bus fleets that may charge overnight and provide time of use benefits to the grid.
- A demand charge "credit" could be applied for a period of time to qualifying service application that only provide power to support electric vehicle charging.
- The utility could consider pricing signals to the station operator, such as time-of-use or critical peak pricing.
- Utilities should factor in the overall EV load from all vehicles in its service territory and its benefit to the grid not just that metered at the DCFC. With increased EV adoption, there will be increased load, which could lead to greater grid benefits in the future.

4. EV Charging Infrastructure:

A. Describe whether more charging stations should be developed in Illinois.

It is essential that policymakers and regulators appropriately align incentives to accelerate the sustainable and scalable growth of the competitive EV charging market in Illinois. There were almost 15,000 EVs registered in Illinois in Q2 of 2018, and industry analysts widely agree that this number will rise significantly. Additional EVSE will be necessary to support that continue growth.

The manner by which policymakers incentivize the deployment of EVSE can either support or hamper the long-term viability of transportation electrification and its associated infrastructure deployment in Illinois. As we will discuss below, policies and regulations to encourage the deployment of EVSE must also encourage innovation, competition, and customer choice in EV charging equipment and network services.

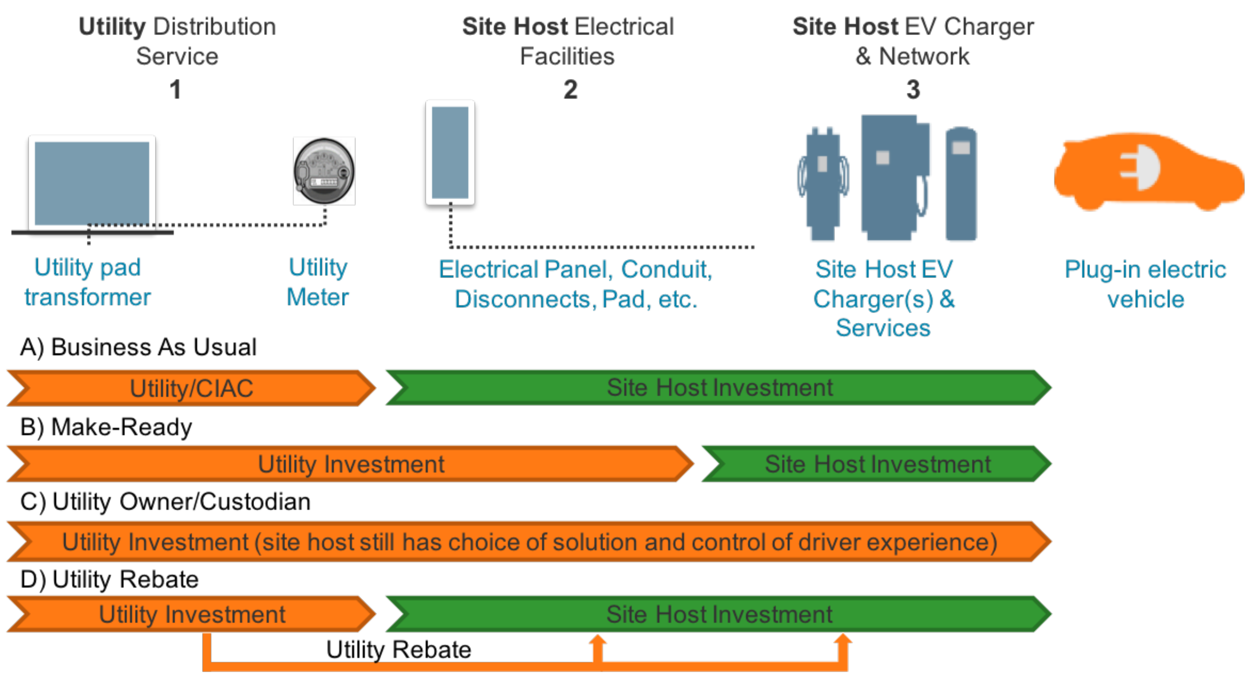
B. Identify the costs associated with installing additional charging infrastructure throughout the state. Assume that installation includes distribution build out, customer make-ready work, and charging equipment.

Answered in conjunction with Question 4.B.a.

a. Describe who would carry the costs of each aspect of building additional charging infrastructure.

The costs associated with installing EVSE can be broadly categorized as distribution buildout, or service; customer make-ready work, or the electrical facilities on the customer's side of the meter; and the EV charging equipment and network services themselves. Figure 2 identifies these broad categories and lists a range of utility program designs and which party would typically carry costs under each category:

Fig. 2: Costs Associated with EV Charging Infrastructure



b. Describe whether ratepayer funds would pay for any aspect of building charging infrastructure.

ChargePoint recommends that the Commission establish clear regulatory guidelines and criteria to evaluate whether it would be appropriate to use ratepayer funds to pay for portions of EV charging infrastructure. Several jurisdictions have established criteria for regulators to evaluate EV charging programs proposed by utilities. In addition to traditional cost-recovery considerations, these criteria often evaluate issues that are specific to the EV and EV charging markets. Some examples include

- California PUC Code 740.12 (a)(2)(b) as amended by SB 350 of 2015 (Sec. 32): "Programs proposed by electrical corporations shall seek to <u>minimize overall costs and maximize overall benefits</u>";
- Utah SB 115 of 2016: "54-20-103. Electric vehicle incentive program. (1) The commission shall, before July 1, 2017, authorize a large-scale electric utility to establish a program that <u>promotes customer choice in electric vehicle charging equipment and service</u>…";
- California PUC Code 740.12 (a)(1)(F) as amended by SB 350 of 2015 (Sec. 32): "The commission shall approve, or modify and approve, programs and investments in transportation electrification, including those that deploy charging infrastructure, via a reasonable cost recovery mechanism, if they are consistent with this section, <u>do not unfairly compete with nonutility enterprises</u> as required under Section 740.3, include performance accountability measures, and are <u>in the interests of ratepayers</u> as defined in Section 740.8."
- In Massachusetts, the Department of Public Utilities established a clear set of criteria for evaluating whether utility EVSE investments are eligible for cost recovery without any direction by the Massachusetts General Court (state legislature). *See* D.P.U. Docket No. 13-182-A, Final Order.

From ChargePoint's perspective, utility programs that appropriately make use of ratepayer funds share a set of common principles that the Commission should consider. Namely, successful utility transportation electrification programs maintain customer choice, encourage innovation, and stimulate competition; leverage matching payments from site hosts, whenever possible; support site-host access and control over pricing; avoid island networks and ensure open access for EV drivers; support equitable access to electric transportation options; and encourage smart charging behavior to enable widespread grid benefits. We will discuss each of these principles in turn.

Maintain Customer Choice, Encourage Innovation, and Stimulate Competition

Utility transportation electrification programs should incorporate a customer-centric approach by allowing a commercial site-host to choose the type, number, and brand of EV charging stations that are installed on the site-host's property, as well as the EV charging network service associated with those stations. Different site-hosts install EVSE for different reasons and with different goals in mind. The EV drivers that will use a site-host's EVSE are also the site-host's customers, employees, tenants, or constituents, so the site-host is best positioned to assess their needs and provide the optimal charging solution. Further, some site-hosts will look for the most cost-effective option while others will be more interested in offering the most advanced features to EV drivers, in addition to cost considerations.

When site-hosts can choose the EVSE that best meets their needs, EVSE vendors strive to develop the most innovative products and compete to meet site-hosts' needs. In other words, a thriving competitive market that offers a wide variety of innovative products at competitive prices depends on a site-host's ability to choose the right product. By contrast, utility programs that rely on procurement of a charging solution through traditional RFP methods may result in a "one-size fits-all" approach that is set for several years and is not able to provide choice and flexibility to participating site hosts and EV drivers. RFPs that result in one single hardware or network offering will also essentially exclude other providers from actively participating in the service territory, making it harder for a self-sustaining market to develop and grow over time. However, RFP processes can be supportive of continued market innovation if they are used to pre-qualify multiple hardware and network service options based on minimum functional criteria that support the site host, EV drivers, and the utility's needs. This ensures that charging solutions meet minimum specifications without picking winners and losers.

Leverage Private Funding

The most impactful and cost-effective utility EVSE programs do not rely exclusively on ratepayer funding. Instead, effective EVSE programs require site-hosts to have some "skin-in-the-game" by sharing in the cost of the EVSE that is deployed. For make-ready and rebate programs, skin-in-the-game typically means that a site-host will pay for any upfront costs of the EVSE, including installation costs, not covered by the utility's make-ready program. Site-hosts can also contribute to overall EVSE costs by providing signage and giving up a portion of their parking lot for EV charging.

Leveraging private funding has two major benefits. First, when site-hosts contribute to the total upfront cost of EVSE, the ratepayer funds dedicated to the program go further and lead to the deployment of more EVSE than they would if the utility were covering 100 percent of the costs.

Second, when site-hosts share in the cost of EVSE, they are motivated to maximize the value of their investment. In practice, maximizing the value of an investment in EVSE means that a site host will try to maximize the utilization of the EVSE by experimenting to find the most effective fee structures, providing visible signage to attract EV drivers, enforcing parking policies so that non-EVs do not block the EVSE, and generally ensuring that the EVSE remains functional and in good repair. By contrast, if a commercial site host has no financial responsibility or vested interest in the station operations they may not be motivated to maximize EVSE utilization, promote awareness, or have any consideration of the driver experience.

Support Site-Host Access and Control Over Pricing

In order to fulfill its own unique goals for hosting EVSE, a site host must be able to access the EVSE's back-end network and have control over pricing of the EV charging services to the drivers. When a site-host has access to the EV charging network, the site host gains valuable insights into how the EVSE is used, such as learning how many charging sessions have occurred, what time of day the EVSE is most often used, the average duration of charging sessions, among other key utilization insights. When a site host can understand and measure how its EVSE is being used, it can manage the EVSE accordingly to maximize the value it provides both to itself and to EV drivers.

Further, a site host must be able to adjust pricing to drivers as it sees fit because different pricing schemes can help site-hosts achieve their various goals. For example, a big-box retailer may want to offer free charging for the first hour to encourage EV drivers to shop in its store, but then charge a fee to encourage drivers to move their vehicles. A MUD owner may want to offer free or discounted charging as a benefit to residents, but charge guests a fee. A convenience store may want to vary the fee it charges throughout the day to encourage charging and attract customers during slower times. Whatever the site host's goal, various pricing structures can help the site-host achieve that goal. As with the skin-in-the-game principle, when a site-host is invested in the success of the EVSE, drivers reap the benefits and ratepayers benefit from a higher utilized grid.

Avoid Island Networks and Ensure Open Access for EV Drivers

Any EVSE program should be designed with EV drivers in mind. Over the long term, transportation electrification efforts will only be successful if EV drivers' overall experience of EV ownership, including public charging, is positive. To ensure positive experiences, an EV driver should be able to charge her vehicle at any publicly available EVSE that is supported by ratepayer dollars regardless of the driver's make of vehicle or membership in an EV charging network. Many EV drivers may choose to join an EV charging network for the convenience that it provides, but membership should not be a requirement to use a charging station. Similarly, EVSE must not be restricted to customers of the utility that supported the deployment of the EVSE. Finally, publicly available EVSE should accept multiple forms of payment, including credit cards, to ensure that charging at public stations is easy and convenient.

Avoiding creating island networks – in which there are networks that only certain drivers can use and which make it difficult for members of the island network to use other charging stations – is crucial to the value proposition for drivers considering purchasing an EV. Island networks make it difficult for EV drivers to travel or move to new cities or in and out of specific utility territories. By contrast, protecting open access for EV drivers ensures a seamless, hassle-free experience that encourages other drivers to purchase EVs.

To ensure that EV drivers have access to EVSE, site-hosts must also be empowered to oversee parking spaces that are restricted to EVs while actively charging. Site-hosts should be allowed (and perhaps required) to install signage restricting parking spaces and permitted to tow vehicles that park in designated parking spots but do not use the EVSE. Such enforcement policies are crucial to ensure that EVSE is accessible to EV drivers when they need it.

Support Equitable Access to Electric Transportation Options

The transition to electric transportation should not leave any groups behind. Utility EVSE programs should include and even emphasize environmental justice and economically disadvantaged communities, perhaps through increased incentives, targeted technical assistance, and encouraging electrification of public transit and/or ride-hailing services to provide solutions to those who do not own their own vehicle. These communities can often benefit the most from transportation electrification through reduced emissions and increased transportation options. The Commission should ensure that any utility transportation electrification proposals account for the unique needs of these communities and include them in their programs.

Encourage Smart Charging Behavior to Enable Widespread Grid Benefits

EVs can be more than simply new load for utilities. With the right policies, rate structures and incentives, EVs can be beneficial loads. For example, through EV-specific TOU rates, a utility can encourage EV drivers to charge during off-peak hours or during peak solar hours, depending on the utility's needs. Customers with smart chargers can also opt in to demand response programs.

ChargePoint recommends that the Commission encourage utilities to consider programs and pilots that can enable such grid benefits through the use of networked charging solutions capable of smart charging and provided detailed charging data. In practice, that means that EVSE must have embedded metering, two-way communications, and have smart charging capabilities including compliance with OpenADR2.0.

It is important to note that utilities do not need to own or operate EVSE in order to enjoy the benefits of smart charging capabilities. Using both incentives and targeted rate structures, utilities can manage energy flows through EVSE without directly owning or controlling the infrastructure itself. In the event the utility does own some EVSE, it can (and should) allow local site-hosts to choose the network services that run on the EVSE and be able to set the default EV driver pricing to align with their specific use case.

C. Describe whether additional charging stations should be installed in densely populated areas, in areas outside densely populated cities, or both.

EVs, as well as electric trucks and buses, present opportunities to make transportation quicker, cleaner, and cheaper throughout Illinois. As such, it is in the public interest to support the deployment of additional charging infrastructure in urban, suburban, and rural areas.

EV charging is leading to a paradigm shift in refueling, in which EV drivers primarily "refuel" their vehicles when they arrive at their destinations. As previously noted, the majority of EV charging will take place at residential locations. However, it is also essential to support the deployment of EVSE at public, and quasi-public, locations.

a. Describe how EV charging infrastructures could penetrate low income communities that generally do not have high EV adoption.

As we noted in the answer to Question 4.B.b., it is essential that advances in transportation electrification be equitably accessible to everyone in Illinois.

D. Discuss ownership of charging stations.

a. Discuss whether utilities should own charging stations. Explain why or why not.

Answered in conjunction with 4.D.b.

b. Discuss whether third party vendors should own the charging stations. Explain why or why not.

Utilities have very important roles to play in supporting transportation electrification in Illinois. First and foremost, utilities are ideally situated to ensure that the associated new load is incorporated in a safe, reliable, and efficient manner. ChargePoint is proud to be a partner of utilities around the country in deploying utility-supported charging infrastructure and pilot programs that incorporate capability for load management. We believe that there is a vital role for utilities in supporting efficient integration of EV load and that the right program design can encourage the installation of more charging stations around the state in a manner that complements, and does not duplicate or conflict with, the private market.

When considering whether to expand the role for utilities to utilize ratepayer funds for cost recovery of incentives or assets on the customer side of the meter (i.e., the competitive EV charging market), it is important to consider Illinois' market today and how it is growing into tomorrow's market.

Public Charging Infrastructure

Publicly-available EV charging infrastructure is installed by a range of different site hosts to provide charging services to customers, employees, tenants and other EV drivers. Site hosts provide EVSE for a wide variety of reasons. Private businesses, including retailers, grocery and convenience stores, hotels, multi-unit dwelling (MUD) owners, among others, may install EVSE to attract new customers or tenants with a valuable amenity. State and local governments may install EVSE to support their emission reduction goals, electrify their own fleet vehicles, attract visitors, and provide a valuable amenity to the community. A wide variety of site hosts may also find it valuable to demonstrate their commitment to sustainability.

Regardless of the reason for hosting a station, site hosts may use pricing as a signal to incentivize charging behavior. Some site-hosts offer free charging for customers and some charge a nominal fee, while still others offer free charging for the first hour or so and then begin charging in order to encourage drivers to make the EVSE available to others. EV drivers can typically find these charging locations, along with information about applicable fees and the number of charging ports, in smartphone apps.

Potential Program Design Options for Utility Programs

As previously noted in the answer to 4.B.a, there are several ways in which ratepayer-funded investments in EV charging can expand access to charging while also complementing the competitive EV charging market. It would be valuable for any of these options to be evaluated by the Commission based on a set of criteria that ensure that programs lead to widespread grid benefits and complement the competitive EV charging market.

Make Ready Programs

"Make-ready" refers to the line extension on the distribution side of the meter as well as wiring, conduit, and sub-panels that are often needed to provide power to EVSE located in a site-host's parking lot on the customer side of the meter. Make-ready infrastructure is essentially an extension of distribution system infrastructure, except that most of it is located behind the site-host's meter and so would usually be considered the responsibility of the site-host. However, deploying and maintaining distribution system infrastructure is one of a utility's core competencies. Accordingly, one of the most effective ways for a utility to support EVSE is for it to support make-ready deployments. A make-ready program could take the form of a rebate or upfront payment to a site-host to use toward make-ready costs, or the utility could use existing personnel and resources to construct the make-ready for interested site-hosts. Either way, the utility can receive valuable charger utilization information by providing this consideration and prepare for future load management programs to better integrate vehicles and the grid.

One advantage of make-ready programs is that the utility effectively leverages the private capital of the site-host to purchase the actual EVSE. When site-hosts share in the total cost of installing the EVSE, program dollars can go further. A make-ready program also has the advantage of focusing the utility on one of its core competencies – long-lasting distribution infrastructure – and allowing the site-host to choose the charging equipment and network services that best meet its needs and support its own goals for installing the EVSE.

As long as the utility spends funds prudently in a way that minimizes costs and maximizes benefits to ratepayers and meets criteria established for the program by the Commission, a utility should be allowed to recover the full cost of a make-ready program from ratepayers, including administration costs. Program criteria should be established in advance and be based on the principles we discussed above. Because make-ready is essentially the extension of distribution infrastructure, a utility should be allowed to recover make-ready costs in the same manner as it recovers the cost of distribution system investments made in the ordinary course of business, namely, by putting the value of the make-ready investments into its rate base. Recovering make-ready costs in this manner would allow a utility to earn its authorized rate of return on the value of these investments, thereby incentivizing and rewarding a utility for supporting the deployment of public EVSE and helping it maintain visibility in to this new and unplanned load.

Utility Rebates

A rebate program would work similarly to a utility's demand-side management (DSM) rebate programs in that it would offer a specific dollar amount to site-hosts for installing qualifying EVSE. It is important that the utility create a list of equipment that qualifies for the rebate to ensure that any EVSE that is installed meets functional requirements and supports the goals of the program, such as providing an open network and managed charging capabilities. The utility should also update the list of qualifying equipment regularly to keep up with the pace of innovation and allow site-hosts to install the newest products.

As with make-ready programs, if the utility spends funds prudently in a way that minimizes costs and maximizes benefits to ratepayers and meets the program's criteria, a utility should likewise be allowed to recover the full cost of a rebate program for customers, including both the cost of rebates and administration costs. Such costs can be recovered similar to how the utility recovers costs for its DSM programs. Alternatively, the Commission could consider allowing a utility to treat the rebate program costs as a regulatory asset and earn its authorized rate of return on the amortized amount. While rebates are not typically included in a utility's rate base, doing so provides an efficient and effective mechanism to reward and incentivize the utility for supporting the nascent transportation electrification market and promote efficient grid integration of EV load.

Similar to the Commission's role supervising a utility's investments in its distribution system or administration of a DSM program, the Commission's role in a make-ready or rebate program is to review, approve, or modify the utility's proposal and supervise the utility's implementation of the approved program. Prior to a utility proposing a transportation electrification program, the Commission should consider establishing standards and guidelines for any utility proposal leveraging industry best practices and input from industry stakeholders.

Utility Ownership

There may be some justifiable use cases where full utility ownership and responsibility of all capital costs may be warranted, such as with economically disadvantaged communities. It is important to note that, even in such situations, the local site host participant can still play an important role in the selection and operation of the station. For example, the site host can still be the customer of record for the utility, paying the standard commercial tariff rates, while also setting the driver pricing for those stations. The utility, through ownership of the station, is able to fully cover the capital costs to deploy the stations and can provide the necessary maintenance and monitoring to ensure the station remains operational.

Should the Commission consider allowing direct ownership of EVSE by utilities, ChargePoint respectfully recommends that the Commission identify program requirements associated with such ownership to avoid any unintended negative market impacts. We identify several examples from other jurisdictions in the response to Question 4.B.

For example, the Commission could ensure that such programs include local site host choice of networking solution vendors and control over the pricing to the EV driver. In doing so, market forces can still be in play, private market actors will be encouraged to invest their own capital and local site hosts will be able to maximize station utilization and optimize the driver experience. Examples of such programs that include utility ownership with local site host choice and control include San Diego Gas & Electric "Power Your Drive" and Pacific Gas & Electric's EV Charge Network in California.

E. Describe whether charging stations should consist of DC Fast Chargers, slow chargers, or a mixture of both. Explain why.

ChargePoint encourages the Commission to avoid a "one-size-fits-all" approach to EV charging equipment and network services. The charging needs for light-, medium-, and heavy-duty vehicles vary wildly.

Fig. 3: EV Charging Levels

chargepoint

EV Charging Basics

	Level 1	Level 2	DC Fast
Electrical Specs	110 – 120 Volts AC 12 – 16 Amps (home appliance)	208/240 Volts AC 32 Amps (home washer/dryer, commercial standard)	208 to 480 Volts DC 70 – 125 Amps (commercial standard)
Range Per Hour of Charging	~3 – 5 miles	~12 – 25 miles	100 - 200 miles +
Typical Time for Full Charge[1]	18+ hours	~2 - 4 hours	~15 - 45 mins

[1] EV with 80 mile range (average of Top 8 Selling mass-market EVs in 2016)

While typical EV charging needs can be met by AC Level 2 charging stations, DC fast stations will continue to play an integral role in supporting EV adoption by extending range along highway corridors and in dense urban environments where dedicated parking is often unavailable.

F. What other utility service options, especially those currently offered in other jurisdictions, could promote EV adoption?

G. What kinds of building code considerations should be kept in mind?

Building codes are sets of rules and regulations that govern standards for how residential and commercial buildings are constructed. "EV Ready" building code can vary by region, but typically require new building construction to prepare a certain proportion of parking spots for EV charging to be installed at a later date, supporting sustainability goals and EV drivers.

When buildings aren't built EV Ready, owners need to engage in expensive and time-consuming retrofitting, adding electrical capacity and running conduit to install EV charging. This can take several weeks and cost tens of thousands of dollars, delaying charging availability, taking time away from other lucrative projects and compromising people's ability to drive electric.

Some examples of EV Ready building codes include California's CALGreen, Vancouver, BC, and Atlanta, GA.

H. Describe technical standards, guidelines, and best practices to manage EV charging standards.

ChargePoint strongly supports Open Access requirements for publicly available EV charging infrastructure (e.g., stations must accept multiple forms of payment and cannot require membership as a precondition). Such requirements have been adopted by statute in Connecticut, New Hampshire, Massachusetts, and California.

We also support utilizing open standards for EV charging network services. Open standards and protocols for EVSE will help regulators ensure that drivers, riders, site hosts, and utilities will be able to access and operate their charging stations even if the EVSE vendor or network services provider one day goes out of business. Similarly, open standards will allow regulators to minimize risk to ratepayers of assets becoming stranded. EV charging network service providers use communications protocols to carry out different types of network services.

Despite similarities in name, the Open Charge Point Protocol (OCPP) has no relationship to ChargePoint, Inc. While ChargePoint's products support OCPP network functionality, we did not create and we do not maintain that specific communication protocol. OCPP is a network communications protocol for EVSE that was developed in Europe to support station to cloud communications. Another example of a communications protocol is OpenADR, which allows utilities and system operators to send automated demand response signals to customers participating in a demand response program, potentially including EVSE site hosts. OCPP is not related to Open ADR and OCPP functionality is not required for charging stations to participate in demand response programs.

Issues related to communications protocols are often conflated with network roaming and "Open Access" requirements. ChargePoint strongly supports advancing network roaming to allow drivers to use an app or RFID card from one charging network to access charging stations on another network. ChargePoint recently announced roaming partnerships with the EV-Box and Flo networks.

ChargePoint is similarly in strong support of Open Access requirements for publicly available EV charging infrastructure (e.g., stations must accept multiple forms of payment and cannot require membership as a precondition), which have been adopted by statute in Connecticut, New Hampshire, Massachusetts, and California.

5. Ratemaking:

A. Describe whether utilities should charge time-varying rates, such as time-of-use rates, to incentivize EV penetration in the state. Explain why or why not.

As we discussed in our response to Questions 2 and 3, time-of-use (TOU) rates are valuable mechanisms to incentivize EV charging to take place at times that are beneficial to the grid, especially for home charging. Whole-house as well as EV specific TOU rates are proven offerings that can encourage customers to modify their charging behavior to align towards time period that are more efficient and cost effective for the grid.

B. Discuss whether charging infrastructures should be included in the rate base if the charging infrastructure is owned by public utilities. Explain why or why not.

As previously outlined, there are multiple categories of investment related to the installation of EV charging infrastructure. Distribution service and line extensions on the utility's side of the meter clearly could be included in the rate base. As we noted in our response to Question 4, the answer to the question becomes more nuanced when considering investments in electrical and charging infrastructure on the customer's side of the meter.

It would be appropriate for investments in charging infrastructure that is owned by public utilities on the customer's side of the meter to be included in the rate base <u>provided</u> that the utility program is consistent with the guiding principles we identified in Question 4. To reiterate, cost recovery would be appropriate provided that the utility program:

- Stimulates customer choice, innovation, and competition;
- Leverages matching payments from site hosts, whenever possible;
- Supports site-host access and control over pricing;
- Avoids island networks and ensure open access for EV drivers;
- Supports equitable access to electric transportation options; and
- Encourages smart charging behavior to enable widespread grid benefits.

6. Regulatory Treatment of EVs and Charging Stations:

A. Discuss whether EVs should be treated as distributed energy resources (DERs) for regulatory purposes. Explain why or why not.

Electric vehicles, in part or fully powered by electricity from the grid, along with the associated charging infrastructure, do not by themselves necessarily fall under existing definition of DERs. Some electric vehicles and charging equipment have the capability to undertake load management functions and ensure the efficient use of energy. Electrification of vehicles is generally considered to be a more efficient form of transportation and there are certain charging technologies that are more efficient in the provision of fuel than others. However, the primary purpose of EVs and EVSE is to support the conveyance of drivers, riders, and goods between destinations. These critical transportation functions require separate consideration from DERs.

Broadly treating EVs and EVSE as DERs that only serve the grid would not give due consideration for how best to create potential benefits to the grid, reduce costs for ratepayers, or avoid negative impacts to the competitive marketplace. We respectfully urge the Commission to explore the creation of a consistent, statewide framework to address the unique case of EVs and EV charging rather than apply existing DER transportation electrification technologies. By so doing, Illinois would be in a position to accelerate the sustainable and scalable growth of its EV and EV charging markets while also creating a beneficial load for the grid.

a. Discuss whether passenger cars, transportation vehicles, and corporate fleets should be treated equally. Should one type be favored over others? Explain why or why not.

As we discussed in our response to Question 2.B, different EV charging load profiles present different value propositions to the grid. Passenger cars, transportation vehicles, and corporate fleets all have different EV charging load profiles. While one type of transportation should not be favored over another, some may be more suitable to serving as reliable DERs than others.

Appendix A – Barriers to EV Charging

Use Case	Barrier
Residential *Single Dwelling*	● Lack of garage/dedicated parking ● Lack of EV-specific signals/load management to encourage off-peak charging ● Requirement for secondary utility meter for EV charge tracking & potential billing
Residential *Multifamily*	● Lack of decision-making authority to install EVSE (e.g., permission from condo board) ● Technical/power challenges: insufficient capacity; distance to parking stall(s); etc. ● Restrictions on using advanced features in networked EVSE (e.g., power management to avoid capacity upgrades; embedded metrology to avoid cost of additional meters; etc.) ● Multi-Unit Dwellings (MUDs) have multiple use cases: shared vs assigned parking ● Lack of EV Ready requirement leads to higher retrofit installation costs ● Upfront cost of installation
Quasi-Public *Workplace*	● Upfront cost for installation; ● Restrictions on using advanced features in networked EVSE (e.g., power management to avoid capacity upgrades; embedded metrology to avoid cost of additional meters; etc.) ● Regulatory clarity regarding treatment of non-utility energy-based sales for charging
Public *Level 2*	● Upfront cost for installation; ● Municipal permitting/zoning requirements ● Regulatory clarity regarding treatment of non-utility energy-based sales for charging ● Lack of EV Ready requirement leads to higher retrofit installation costs
Public *DC fast charging (community)*	● Upfront cost of equipment and installation ● Lack of available electrical capacity at existing sites and high cost to supply sufficient utility distribution service ● Regulatory clarity regarding treatment of non-utility energy-based sales for charging ● Electric interconnection costs ● Three different common charging connectors ● High operating costs of DC fast chargers due to low load factor & traditional, demand-based electricity rates
Public *DC fast charging (corridor)*	● Upfront cost of equipment and installation and operation ● Regulatory clarity regarding treatment of non-utility energy-based sales for charging ● Access to appropriate site hosts with adequate amenities and safety ● Lower expected utilization along corridors ● Electric interconnection costs ● High operating costs of DC fast chargers due to low load factor & traditional, demand-based electricity rates
Overarching *Policy, regulatory, & industry*	● Regulatory clarity regarding treatment of non-utility energy-based sales for charging ● Regulatory clarity regarding utility role in competitive EV charging market ● Rate structure options & mitigation opportunities for fast charging ● Ability to roam between networks